

EMI CERTIFICATION REPORT

Applicant:

LG Electronics Mobilecomm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: November 16, 2012

Test Report No.: HCTE1211FE04

Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID:

ZNFAN160

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : Cellular/PCS CDMA Phone with Bluetooth
Model Name : LG-AN160
Additional Model Name : AN160, LGAN160, LG236C
Port / Connector(s) : USB / Headset Port

The device bearing the trade name and model specified above, has been shown to comply with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003. (See Test Report if any modifications were made for compliance)

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.



Report prepared by
: Jeong-Hyeon Choi
Test Engineer of EMC Team



Approved by
: Jin-Pyo Hong
Manager of EMC Team

DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCTE1211FE04	November 16, 2012	Initial Release

TABLE OF CONTENTS

	PAGE
1. GENERAL INFORMATION.....	4
1.1 Product Description.....	4
1.2 Related Submittal(s) / Grant(s).....	4
1.3 Tested System Details.....	5
1.4 Cable Description.....	6
1.5 Noise Suppression Parts on Cable. (I/O cable)	6
1.6 Test Methodology.....	7
1.7 Test Facility	7
1.8 Frequency Range of Radiated Measurements.....	7
2. SYSTEM TEST CONFIGURATION	8
2.1 Configuration of Test System.....	8
3. PRELIMINARY TEST	9
3.1 Conducted Emission Test	9
3. 2 Radiated Emission Test	9
4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY	10
4.1 Conducted Emission Test	10
4.2 Radiated Emission Test	15
5. FIELD STRENGTH CALCULATION	17
6. TEST EQUIPMENT	18
7. CONCLUSION.....	19

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **EUT type: Cellular/PCS CDMA Phone with Bluetooth, Model: LG-AN160** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	LG-AN160
Additional Model	AN160, LGAN160, LG236C
FCC ID	ZNFAN160
E.U.T Type	Cellular/PCS CDMA Phone with Bluetooth
TX Frequency	824.70 MHz to 848.31 MHz (CDMA 835) 1 851.25 MHz to 1 908.75 MHz (CDMA 1 900)
RX Frequency	869.70 MHz to 893.31 MHz (CDMA 835) 1 931.25 MHz to 1 988.75 MHz (CDMA 1 900)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Manufacturer	Model Name	FCC ID / DoC	Connected to
E.U.T	LG	LG-AN160	ZNFAN160	Notebook PC, Headset
Notebook PC	H.P	ProBook 6560b	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	CHICONY POWER TECHNOLOGY	Series PPP012H-S	-	Notebook PC
Mouse	Radio shack	Series 2-button mouse	FSUGMZE3	Notebook PC
USB cable	BD	SGDY0018501	-	E.U.T Notebook PC
Headset	CRESYN	SGEY0005596	-	E.U.T
Net hard	LG	N1A1DD1	DoC	Net hard adaptor Notebook PC
Net hard adaptor	Yang Ming Industrial	DA-60M12	-	Net hard
RJ45 cable	-	-	-	Notebook PC Net hard

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
E.U.T	Micro USB	Y	Y	(P,D)1.2
	Headset jack	-	N	(D)1.5
Notebook PC	RJ 45	-	N	(D)1.5
	Serial (Mouse)	-	N	(D)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
E.U.T	Micro USB	N	N/A	Y	Both End
	Headset jack	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	Both End
	Serial (Mouse)	-	-	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

1.7 Test Facility

Chamber used to collect the test data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyongki-Do, Republic of Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3m)	90661(Mar. 02, 2011)
Radiated Field strength measurement facility (10m)	90661 (Sep. 03, 2010)

1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

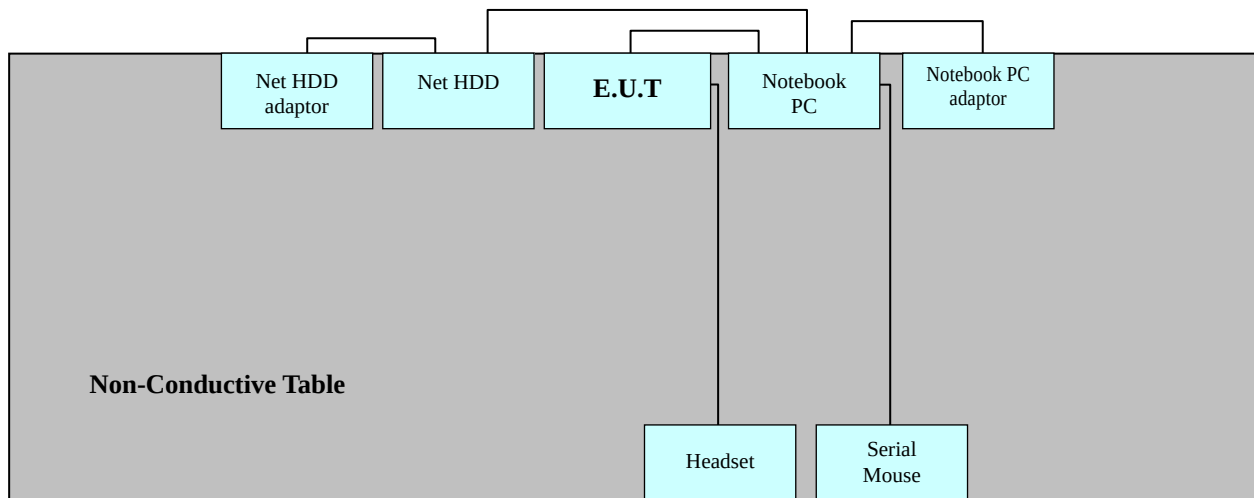
Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

- Power Line Conducted test : E.U.T was connected to LISN via Notebook PC.
Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.
- Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m and 10 m semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 120 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link Mode

3. 2 Radiated Emission Test

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link Mode

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Data Link mode
Temperature	: 18.9 °C
Humidity Level	: 42.0 %
Test Date	: November 13, 2012

Frequency (MHz)	Transd (dB)	Conductor (H/N)	Quasi-Peak			Average		
			Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)	Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)
0.498	10.0	N	56	27.5	37.5	46	-	-
0.508	10.0	N	56	28.2	38.2	46	-	-
0.648	10.0	N	56	31.0	41.0	46	-	-
1.860	9.9	H	56	23.6	33.5	46	17.60	27.50
16.500	11.2	H	60	-	-	50	17.60	28.80
16.716	11.2	H	60	-	-	50	17.20	28.40

※ NOTE: Refer to page 11 to page 14 for details.

1. Transd = LISN Factor + Cable Loss Factor
2. Line H = Hot, Line N = Neutral

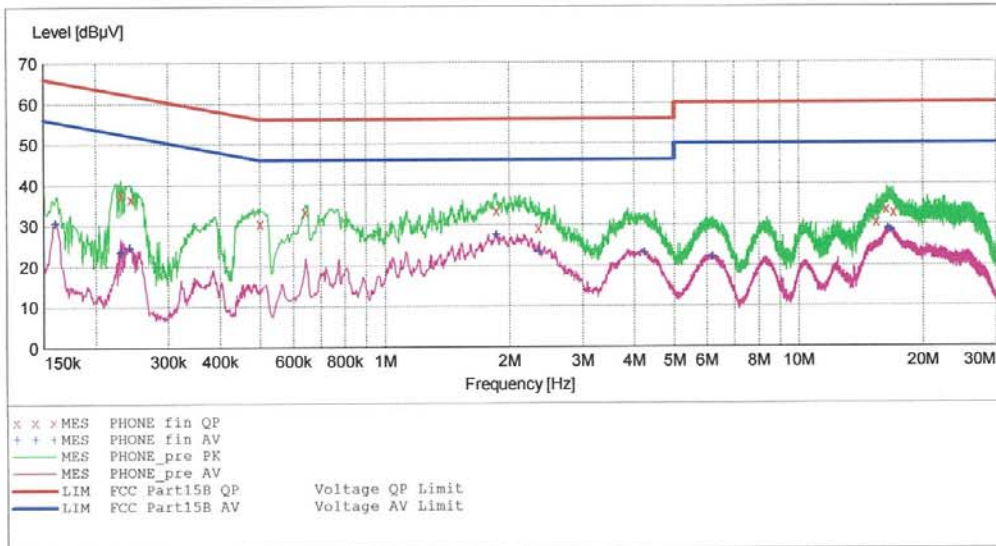
HCT

EMC

EUT: AN160
Manufacturer: LG
Operating Condition: DATA LINK MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART 15 B
Comment: H

SCAN TABLE: "FCC PART 15 B(H)"

Short Description:			FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

11/13/2012 8:34PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.230010	37.50	9.8	62	24.9	---	---
0.243010	36.50	9.8	62	25.5	---	---
0.499010	30.50	9.8	56	25.5	---	---
0.644000	33.40	9.8	56	22.6	---	---
1.860000	33.50	9.9	56	22.5	---	---
2.360000	29.10	10.0	56	26.9	---	---
15.444000	30.60	11.0	60	29.4	---	---
16.304000	33.60	11.2	60	26.4	---	---
16.952000	32.90	11.3	60	27.1	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2012 8:34PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.160010	30.60	9.7	56	24.9	---	---
0.230010	23.50	9.8	52	28.9	---	---
0.242010	24.50	9.8	52	27.5	---	---
1.860000	27.50	9.9	46	18.5	---	---
2.364000	23.40	10.0	46	22.6	---	---
4.248000	23.00	10.1	46	23.0	---	---
6.200000	22.00	10.2	50	28.0	---	---
16.500000	28.80	11.2	50	21.2	---	---
16.716000	28.40	11.2	50	21.6	---	---

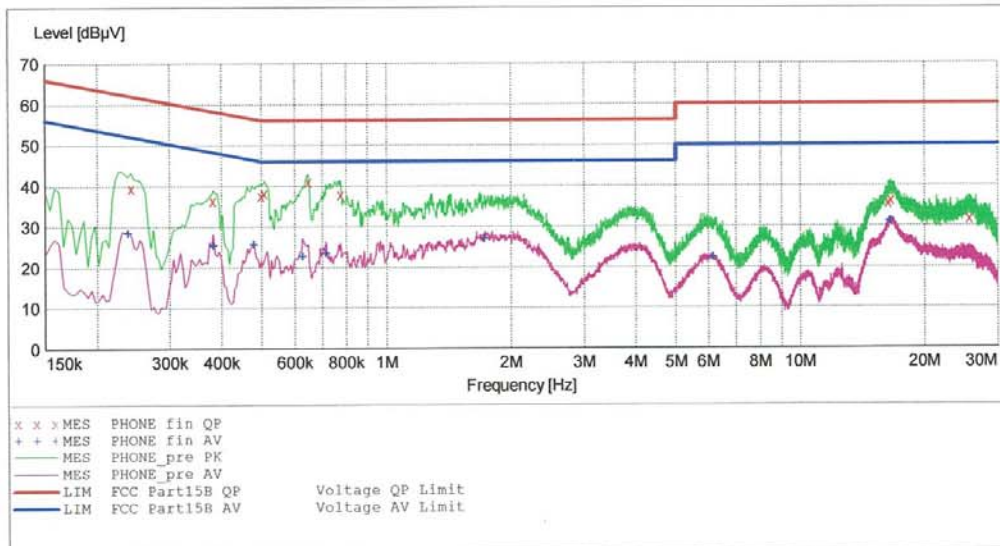
HCT

EMC

EUT: AN160
Manufacturer: LG
Operating Condition: DATA LINK MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART 15 CLASS B
Comment: N

SCAN TABLE: "FCC PART 15 B(N)"

Short Description:			FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer
Frequency	Frequency	Width				
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None
			Average			



MEASUREMENT RESULT: "PHONE_fin QP"

11/13/2012 8:30PM

Frequency MHz	Level dBuV	Transd dB	Limit dBuV	Margin dB	Line	PE
0.242010	39.50	10.0	62	22.5	---	---
0.382010	36.40	10.0	58	21.8	---	---
0.498010	37.50	10.0	56	18.5	---	---
0.508000	38.20	10.0	56	17.8	---	---
0.648000	41.00	10.0	56	15.0	---	---
0.776000	37.80	10.0	56	18.2	---	---
16.328000	35.70	11.5	60	24.3	---	---
16.560000	36.30	11.5	60	23.7	---	---
25.648000	31.70	12.4	60	28.3	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2012 8:30PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.238010	28.40	10.0	52	23.8	---	---
0.382010	25.40	10.0	48	22.8	---	---
0.478010	25.60	10.0	46	20.8	---	---
0.628000	22.70	10.0	46	23.3	---	---
0.716000	23.50	10.0	46	22.5	---	---
1.728000	26.90	10.1	46	19.1	---	---
6.172000	22.30	10.4	50	27.7	---	---
16.504000	31.00	11.5	50	19.0	---	---
16.548000	31.00	11.5	50	19.0	---	---

4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

-For measurement below 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)

Operation Mode : Data Link mode

Temperature : 23.2 °C

Humidity Level : 41.7 %

Test Date : November 13, 2012

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
41.60	21.03	V	1.00	11.80	1.07	40.0	33.90	6.10
49.00	19.77	V	1.00	12.05	1.18	40.0	33.00	7.00
53.30	21.71	V	1.20	11.77	1.22	40.0	34.70	5.30
86.30	21.68	V	1.50	8.14	1.58	40.0	31.40	8.60
119.40	20.98	V	12.00	11.24	1.88	43.5	34.10	9.40
183.50	14.50	H	1.20	11.06	2.34	43.5	27.90	15.60

-For measurement above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz, VBW: 1 MHz)
: Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)

Operation Mode : Data Link mode

Temperature : 23.6 °C

Humidity Level : 40.4 %

Test Date : November 15, 2012

Frequency (GHz)	Peak			POL	Average		
	Total (dBμV/m)	Limit (dBμV/m)	Margin (dB)		Total (dBμV/m)	Limit (dBμV/m)	Margin (dB)
1.8000	51.70	74	22.3	H	30.40	54	23.6
3.5500	48.20	74	25.8	V	29.20	54	24.8

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5th harmonic of highest fundamental frequency. Test was measured by 12 GHz.

5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.

The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB μ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB μ V/m value is mathematically converted to its corresponding level in μ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

[Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	μ V/m	dB μ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. TEST EQUIPMENT

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Next CAL Date
------	--------------	------------	---------------	-------------------	---------------

Conducted Emission

☒	EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2013.05.02
☐	EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2013.06.18
☐	LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2013.07.04
☒	LISN	EMCO	3816/2SH	9706-1070	1 year	2013.05.02
☒	LISN	Rohde & Schwarz	ENV216	100073	1 year	2013.02.09
☐	Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2013.07.31

Radiated Emission

[30 MHz - 1 GHz]

☒	EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
☒	Trilog Antenna	Schwarzbeck	VULB9160	3125	2 year	2013.05.03
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
☐	Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2013.02.08
☐	Antenna master	HD GmbH	MA240	240/520	N/A	-
☐	Turn Table	HD GmbH	2090	9702/1224	N/A	-

[1 GHz - 12 GHz]

☒	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
☒	Antenna master	HD GmbH	MA240	240/520	N/A	-
☒	Turn Table	HD GmbH	2090	9702/1224	N/A	-
☒	Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2013.09.11
☐	Horn Antenna	Schwarzbeck	BBHA 9120D	147	2 year	2013.05.15
☐	Horn Antenna	Schwarzbeck	BBHA 9120D	937	2 year	2013.10.17
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.02.20

7. CONCLUSION

The data collected shows that the **EUT type: Cellular/PCS CDMA Phone with Bluetooth, Model: LG-AN160, FCC ID: ZNFAN160** complies with §15.107 and §15.109 of the FCC rules.